



2345	Tokyo-Narita	AA	5832	D44	Boarding
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# The Connected Airline

Steve Hansen, Director of AirCentre Flight Planning Solutions

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# Agenda

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-  Industry Trends And Challenges
-  Connected Airline Strategy
-  The SOC Challenge
-  Proactive Problem Solving – SOC and Air Traffic Control Harmonization

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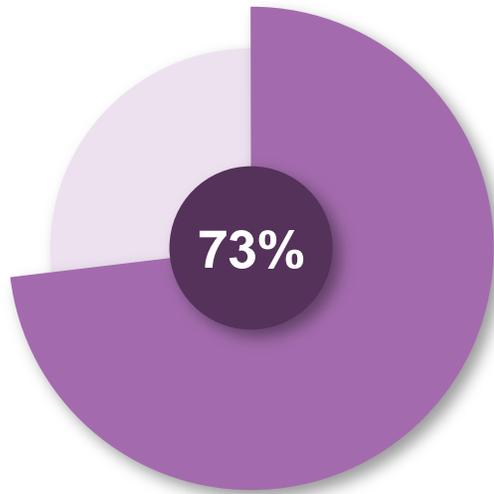
# Industry Trends and Challenges

The freedom to better  
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the way you want

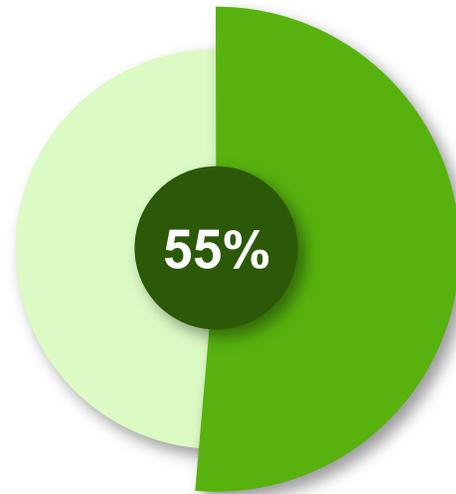
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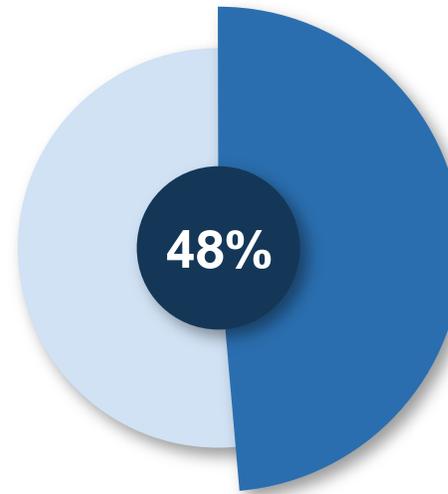
# Top Strategic Priorities From An Airline Operations Leader Point Of View\*



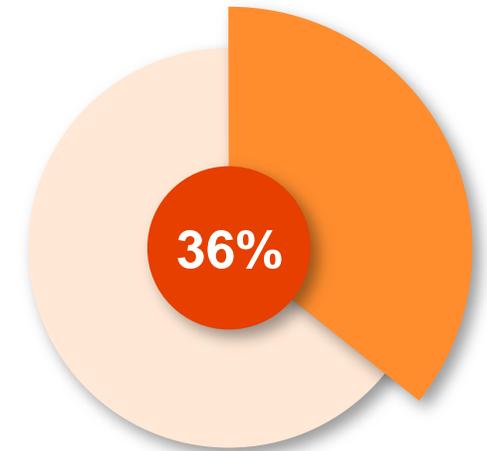
1 Improve operational performance



2 Reduce operating costs



3 Improve the customer experience



4 Improve disruption handling

Execute best possible operational plan and deliver on promised customer experience

# Industry Challenges Impacting Airline Operations



Rising passenger volumes



Growing prevalence of social media



Increasing load factors



Workforce satisfaction suffering

79.6%

Mar. 2016 global load factor

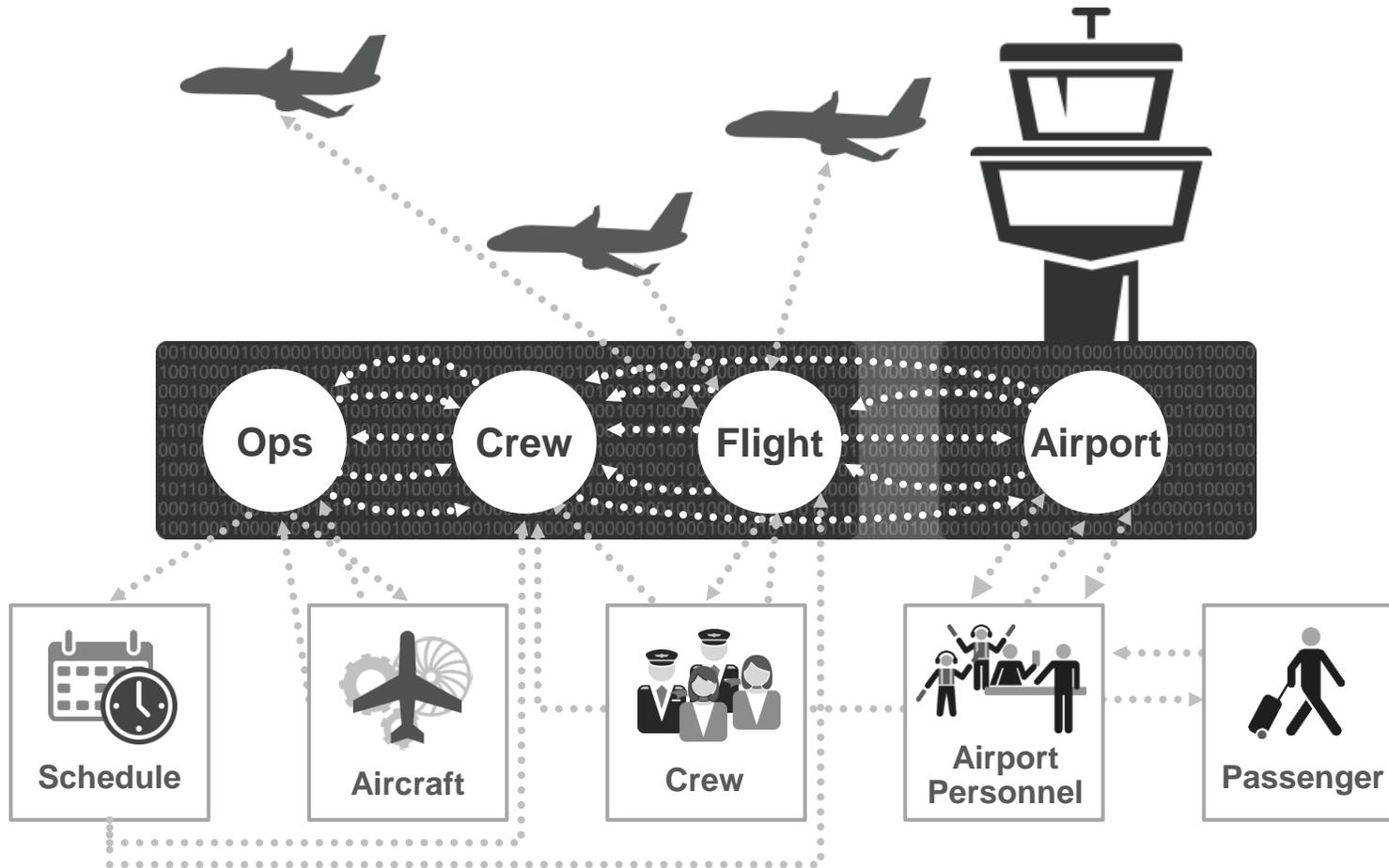
1800%

Increase in social media activity during 2015 North American blizzard

21%

Global flights delayed >15 min in Jan. 2016

# Internal Business Challenges Compound Operational Difficulties



Limited access to real-time data

Siloed decision making

Disparate communications

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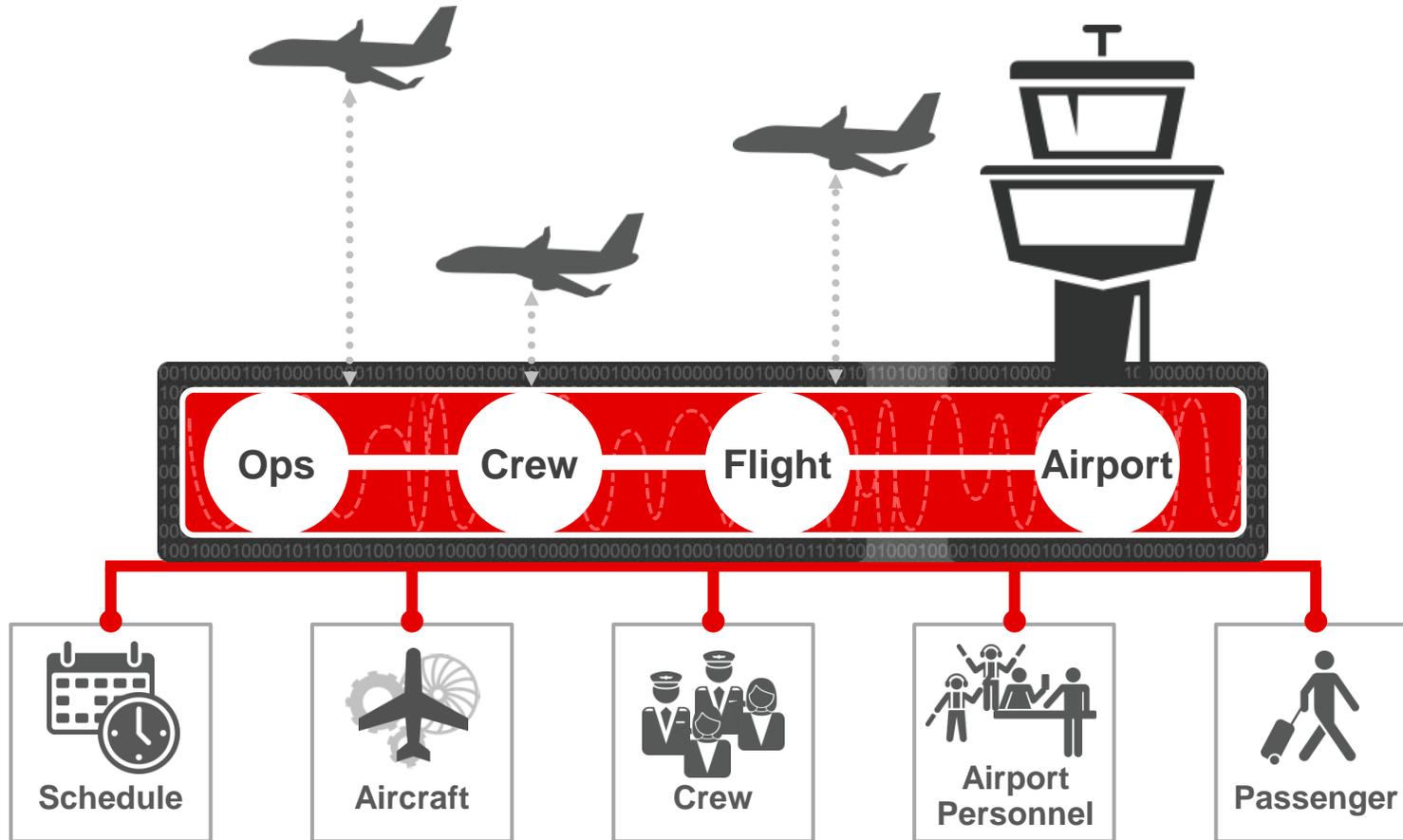
# Connected Airline Strategy

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# Deliver Your Promised Customer Experience With A Connected Airline



**Simplify** workflows and access to real-time data



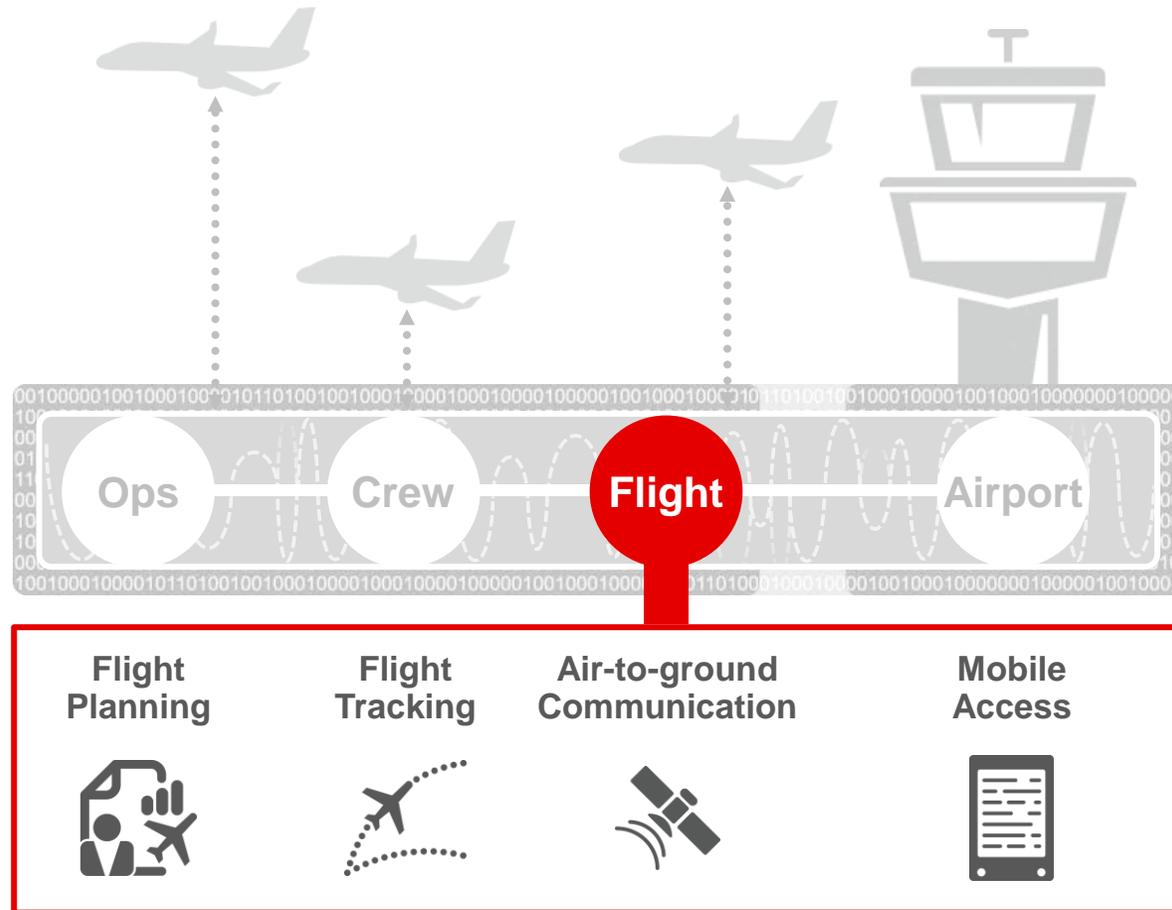
**Integrate** systems and processes



**Streamline** communications via **mobile** solutions

Drive operational efficiency • Deliver a positive guest experience • Improve profitability

# Enabling The Connected Flight For Confident Decision Making



**Simplify** workflows by uniting flight planning and tracking



**Integrate** real-time flight data for a single, shared view



**Mobile** delivery of flight information to the cockpit

Manage evolving conditions • Total cost picture • Shared operational view

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# The SOC Challenge

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## The Biggest SOC Challenge

How to gather, compile, and analyze all available and relevant data  
(in a constantly changing, real-time environment) and  
**make the best possible operation decisions**

“Our teams are drowning in data –  
but starving for insights”

“I don’t have time to research all potential options, so I  
make the best possible decisions with the information I  
have”

# SOC Challenges Can Be Contradictory

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When subject to system constraints that produce delays, cancellations, etc...

---

## SOCs will base decisions on:

- Optimizing system completion factor (reduce cancellations)
  - Can negatively impact on-time performance and bank or connection integrity
- Optimizing system on-time performance
  - May require cancellations and misconnections
- Maintaining domestic and international connection integrity (reduce misconnections)
  - Can cause system delays and disruption to hub banks
- Maintaining bank integrity
  - Delays
- Maintaining *Customer First* Initiatives
  - Whatever new thing marketing comes up with that makes operations people shake their heads

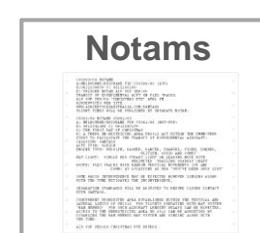
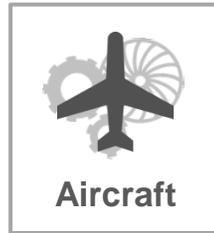
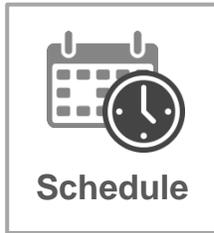
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These operational KPI's routinely change due to a consistent desire to improve DOT reporting

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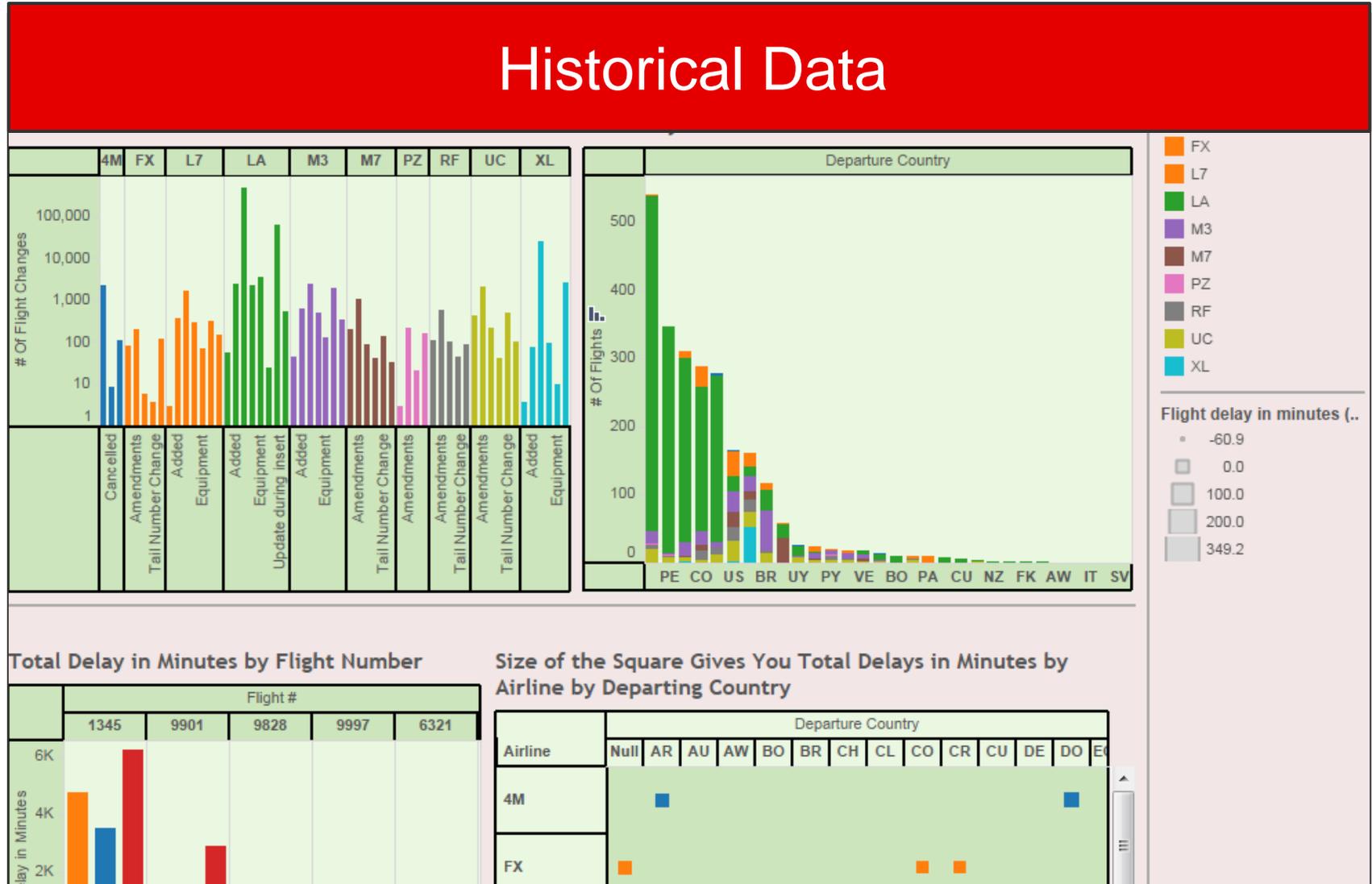
# Data Required For SOC Decision Making

## Real-time Data



# Data Required For SOC Decision Making

- Actual vs. plan
- Fuel data
- Block time data
- Passenger data
- System performance data



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# Proactive Problem Solving

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# Connected Flight – Automated Capabilities

## Data Updates

- ✓ Schedule
- ✓ Aircraft
- ✓ Crew
- ✓ Payload
- ✓ MEL
- ✓ ETD
- ✓ Position Reports

## Flight Preparation

- ✓ Route optimization
- ✓ Fuel calculation
- ✓ Special Planning/OpsSpec
- ✓ EROPS solution
- ✓ Terrain analysis
- ✓ RAIM check\*
- ✓ AeroData runway analysis\*

## ATC Filing

- ✓ Flight Plan
- ✓ Delay
- ✓ Change
- ✓ CTOP

## Recalculation

- ✓ on Time triggers
- ✓ on Aircraft changes
- ✓ on Payload updates
- ✓ on ETD updates
- ✓ on Position Reports

## Extended Options

- ✓ Flight Release
- ✓ Create and send Briefing documents to crew (eFM, Web portal, email)
- ✓ Flight statistics (XML)

Optional features\*

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# Proactive Problem Solving: SOC and Air Traffic Control Harmonization

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# New Opportunities In Data Communication

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## Data Communication Program is a key element in implementing FAA NextGen

- First phase of transition from voice to digital communication
  - This change is necessary to implement air/ground trajectory automation capabilities.
  - Examples currently in use:
    - Controller-Pilot Data Link Communications (CPDLC)
    - Pre-departure clearance (PDC)
- 

## Industry strategy is moving toward EFB

- Complete briefing capabilities
  - Real-time communications
  - Sharing aircraft data
- 

Benefit: Enables real-time communication of data and reduces potential for human error

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# New Opportunities From FAA NextGen - SWIM

System Wide Information Management (SWIM) will enable real-time data exchange and sharing among NAS stakeholders.

Traffic Flow Management System  
(TFMS)  
Replaced ASDI April 2016



- Provides: Aircraft track position reports, advisories, reroutes, restrictions, GDP/UDP/AFPP, FCA/FEA and CTOP
- **Benefit:** One connection point offering most currently available data. Access to EDCTs is currently restricted to non CDM members – Customers would recognize immediate value by making EDCTs available in third party software

Time Based Flow Management  
(TBFM)  
Available late 2016/early 2017



- Provides: Metering information leading to better predictability such as intelligent ETAs
- **Benefit:** By improving throughput, airlines will operate more efficiently through reduced taxi-times, airborne holding and gate/resource management

SWIM Terminal Data Distribution  
Systems (STDDS)



- Provides: Surface aircraft positions, departure/arrival runways and fixes and taxi start/takeoff times
- **Benefit:** Airlines will be able to plan more efficiently with this real-time information to reduce taxi fuel and better manage disruptions

## New Opportunities From FAA NextGen - SWIM (continued)

System Wide Information Management (SWIM) will enable real-time data exchange and sharing among NAS stakeholders.

Aeronautical Data



- Provides: Digital NOTAMS, TFR and SUA
- **Benefit:** Access to this real-time information will allow customers to plan more efficiently around restrictions

Weather Data



- Provides: Integrated Terminal Weather System (ITWS)
- **Benefit:** Better gust front, microburst, tornado, wind shear and storm motion forecasting creates better predictability for airlines to manage their business objectives

# CTOP – A Step In The Right Direction

## Challenge:

Reduce ground delays due to traffic management bottlenecks

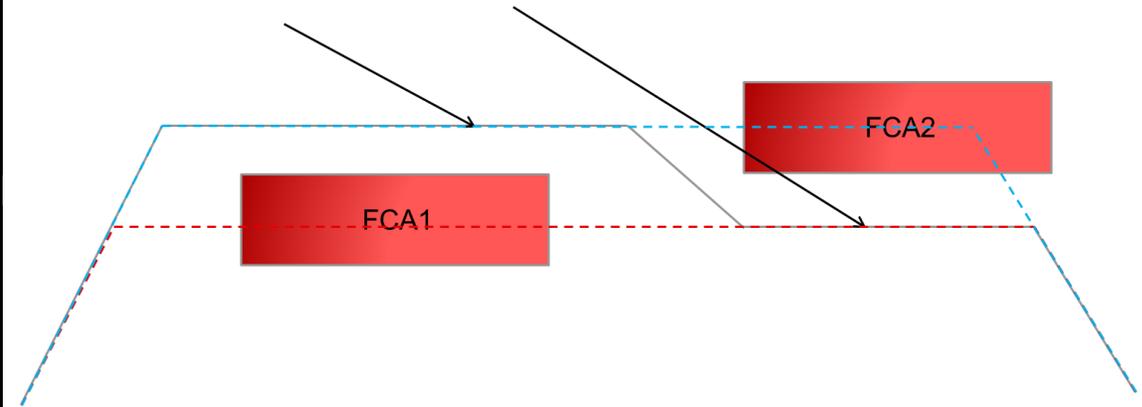
## Solution:

CTOP was created to provide a program and interface to transmit a route catalogue to the Traffic Flow Management System (TFMS).

“Network Manager” in the FAA can assign a different route to a flight rather than either:

1. Starting communication with ATC coordinator OR
2. Issuing ground delays to overcome a constraint area

*In essence, instead of ATC negotiating a bottleneck with the flight operations department, ATC just selects a different route for them.*



## Result:

Overall, an improvement but has some drawbacks:

- Options are calculated an hour or more before departure, which means that they are often invalid at the time of selection.
- Options limited to one altitude and one speed

# But the Airlines still need cohesive gate-to-gate ATM constraint and impact predictions

## Reliable prediction of arrival times

- Departure airport push back time
- Accurate taxi time and departure runway queue
- Enroute TBFM impact
- Destination airport arrival delays/holding time predictions

## Essential to SOC decision making

The ATM landing time prediction will trigger airline gate management and operations control systems to effectively manage impacts to the airline schedule

## Cohesive gate-to-gate constraint information

- Visibility, based on capacity/demand predictions based on probability of impact to UPT
- Automated feedback to SOC of flight plan risk of ATM modification

## Allows for optimized 4D UPT flight planning

As envisioned with CTOP and other ATM concepts, the airline needs to weigh risk of a chosen route against less optimal route but which may less probability of delay or ATM modification while enroute

## Collaborative inflight route modifications

- Provide reroute proposals between TFMS and SOC automation for tactical inflight reroutes beyond specific time/distance values e.g. 50nm or +/- 10 minutes

## Enables dynamic and beneficial adjustments to changing weather conditions

Automated exchange of reroute proposals from either the SOC or TMU when opportunities for route improvements are presented will allow faster analysis and coordination, including with the flight deck

# Questions ?

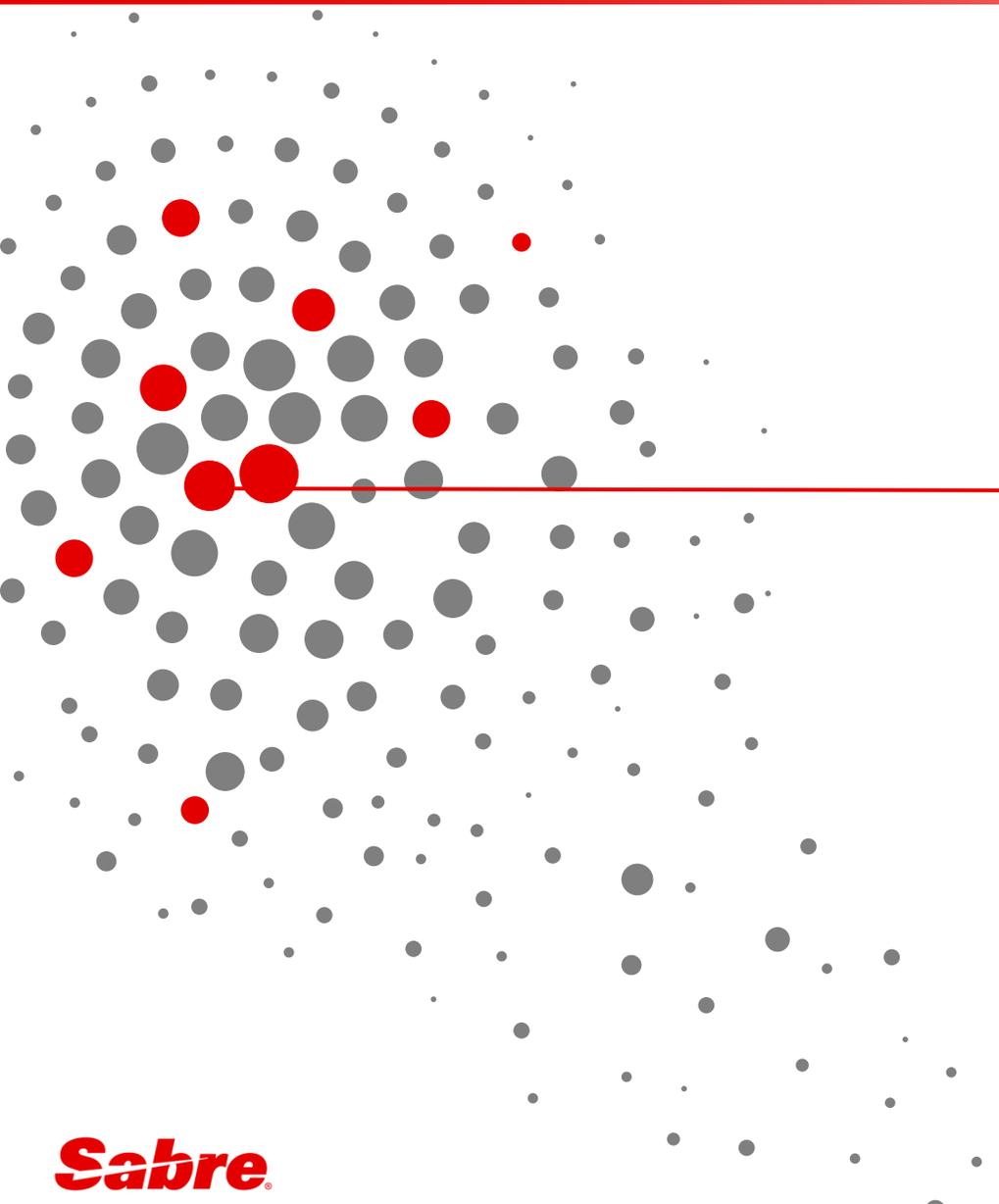
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# Contact Us



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